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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,259	03/09/2001	Chung-Chieh Lee	CM03403J	2869

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MOTOROLA, INC
INTELLECTUAL PROPERTY SECTION
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EXAMINER	
NGUYEN, HANH N	

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 08/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/803,259	LEE ET AL.	
	Examiner	Art Unit	
	Hanh Nguyen	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *51-53* is/are allowed.

6)☒ Claim(s) *1-11,13,18-22 and 24-50* is/are rejected.

7)☒ Claim(s) *12,14-17 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 3, 4-6, 7, 8, 9, 10, 11, 13, 18, 22, 24, 30, 31, 37, 38, 39, 42, 43, 44, 45, 48, 49, 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahany et al. (Pat. 5,740,366) in view of Garcia-Luna-Aceves et al. (Pat. 6,836,463 B2).

In claims 1, 37, 38, 42 and 48, Mahany et al. discloses a logical topology representative of a network having a plurality of network nodes (fig.1 discloses a network comprising a plurality of bridges) include a node added to the network (having a RF terminal 110 trying to attach to the network), comprising: identifying one or more neighboring nodes of the plurality of network nodes that are within one hop of the node (following the configuration of the network disclosed in fig.2, the RF terminal 110 (the node adding to the network) identifies that node 42 (one neighboring node) is one hop away (see col.6, lines 18-30); identifying a neighboring node of the one or more neighboring nodes having a minimum depth from a root node of the network (the node 42 is closest to the root node 20, see col.6, lines 29-32). Mahany et al. further discloses the node transmitting broadcast confirmation message that informs the one or more neighboring nodes of an identifier of the parent node and a depth of the node from the root node (step 209, fig.2 discloses the unattached terminal / unattached bridge enters attached state, col.4, lines 24-28). Mahany etal. does not explicitly disclose assigning the neighboring node having the

minimum depth from the root node as a parent node of the node. Since the node 42 is attached to the root node 20 and closest to the root node 20, it is well-known in the art to select the node 42 as its parent node (assigning the neighboring node having the minimum depth from the root node as a parent node of the node).

Mahany does not disclose creating a range list comprising routing information for only those nodes that are within one hop of the node; and obtaining network topology information of the node on the range list. Garcia-Luna-Aceves et al. discloses creating a range list comprising routing information for only those nodes that are within one hop of the node; and obtaining network topology information of the node on the range list (each router 18 in network 10, fig.1, maintains a routing graph (range list) or topology graph (obtaining network topology information) that includes state information about adjacent links reported by its neighbors (network topology of the nodes on the range list. Col.6, lines 1-5, Further, the aggregation of adjacent links reported by neighbors constitutes partial topology known by a router, See col.6, lines 9-11). Garcia-Luna-Aceves et al. further discloses, in col.23, lines 25-35, that forming a partial topology graph for a router is made by combining router state information of each adjacent router (range list comprising routing information for only nodes that are within one hop). Therefore, it would have been obvious to one ordinary skilled in the art to assign a node closest to a root node in Mahany et al. as a parent node in order to transmit stronger signal to neighbor nodes within the network and apply to expand communication in the AD-Hoc network dynamically. Furthermore, configuring a range list that comprises adjacent nodes to a new node into Mahany would provide nodes in the AD hoc network updated routing information.

In claims 2, 3, 39, 44 and 50, Mahany et al. discloses the node sending an attached request to the plurality of network nodes of the network (when the RF terminal 110 is lost to its attached node, the RF terminal 110 sends an attached request to the attached node closest to the root node 20, see col.7, lines 66-67). Upon receiving the the attached request, the one or more neighboring nodes transmitting one or more corresponding reply messages to the node (the attached node acknowledges the request and sends the request to the root node 20 which returns an end-to-end confirm packet to the RF terminal 20, see col.7, line 67 to col.8, line 2). In response to receiving the one more reply messages (confirm message) sent by the one or more neighboring nodes, the node adding the one or more neighboring nodes to range list of the node (each node or RF terminal comprises a routing table which updates a new entry (message) received from another node, see col.6, lines 55-64). Mahany et al. does not disclose sending a hello message to a plurality of network nodes. Ogier et al. discloses sending a hello message to a plurality of network nodes (Fig.12 discloses a new node i sending a hello message to node j in a subnetwork 10, see col.27, lines 22-34). Therefore, it would have been obvious to one ordinary skilled in the art to modify the Mahany et al. by transmitting the hello message as taught by Ogier et al. in order to determine whether any node in the network is in the transmission range of a new node I wishing to join the network.

In claim 7, Mahany et al. discloses the network topology information comprises one or more of depth (a node closest to root node 20) , loading (col.6, lines 32-45 discloses a RF terminal 114 attaches to the least busy node 50), and identifier information (node Id, terminal ID).

In claim 8, Mahany et al. discloses the depth of the node from the root node is one greater than the minimum depth of the parent node (col.6, lines 25-30 discloses that distance between node 44 and root node 20 (three hops) is greater than that between node 42 and root node 20 (1 hop).

In claim 9, Mahany et al. discloses if two or more of the neighboring nodes have the minimum depth from the root node (nodes 48 and 50 are four hops away from root node 20), assigning a neighboring node of the two or more neighboring nodes having a least number of children nodes as the parent node of the node (RF terminal 114 attaches node 50 which become its parent node). See col.6, lines 32-45.

In claims 4, 5 and 6, as explained in claims 1, 2 above, Mahany et al.further discloses in Fig.2 that if the one or more neighboring nodes have not transmitted the one or more corresponding reply messages, activating a disconnect indicator of the node (Fig.2, step 219, node determines if it has been detached from the network, col.4, lines 35-37); re-positioning the node within the network (if an attached node is overloaded with other attached nodes, the unattached bridge request attachment to the less load node if logical distance is greater than a threshold value, see col.4, lines 50-65, see steps 215, 217); and re-transmitting the hello message to the plurality of network nodes of the network (at step 219, a detach packet is sent to atep 205 which repeats the steps of sending request to be attached to the network, see col.4, line 65 to col.5, line 5).

In claim 43, the limitation of this claim has been addressed in claim 42.

In claims 45 and 50, Mahany et al. discloses a proximity indicator coupled to the processing element of the node operable to indicate when the node is within communication

range of a network node (the RF terminal listens for the broadcast message sent from attached node in the network to detetrmine that it is in the range, see col.6, lines 20-25) .

In claim 49, the limitation of this claim has been addressed in claim 1.

In claims 10, 22 and 24, Mahany et al. discloses a first network node receiving a first update message from a second network node of the plurality of network nodes within communication range of the first network node; and if the second network node is not in a range list of the first network node and therefore a new neighbor of the first network node, updating the range list of the first network node to include the second network node (if a packet arrives from a terminal that is not contained in the routing table of the node, an entry is made in the routing table. The entry includes terminal address and address of the node that sent the packet , see col.6, lines 53-64).

In claim 11, the limitations of these claim has been addressed in claims 1-3.

In claim 30 and 31, Mahany et al. discloses examining a range list of a first network node of the plurality of network nodes, having one or more entries that correspond to one or more network nodes of the plurality of network nodes, to determine which of the one or more network nodes that the network node has not heard from for a period of time (the parent node broadcasts a hello message for a predetermnined number of "count" times, and fail to deliver the message to the child node); deleting from the range list each network node of one or more network nodes that the network node has not heard from for the period of time to generate an updated range list of the first network node (the child node is logically detached from the spanning tree; routing table in each node is adjusted accordingly, see col.14, lines 12-35).

In claims 13 and 18, the subject matters of this claim have been addressed in claims 1, 10, 13, 19, 22, 24, 30, 37, 40, 42, 46.

Claims 19, 20, 21, 25, 26, 27, 28, 29, 32, 33, 34, 35, 36, 40, 41, 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahany et al. (Pat. 5,740,366) in view of Garcia-Luna-Aceves et al. (Pat. 6,836,463 B2), and further in view of Ogier et al. (Pat. 6,845,091 B2).

In claims 19, 40 and 46, Mahany et al. discloses a first network node receiving a hello message from a second network node of the plurality of network nodes within communication range of the first network node (fig.1 discloses an RF terminal 110 listens for broadcasted hello message to determine which attached nodes are in range, see col.65, lines 19-22), the hello message containing network topology information about the second network node (hello message comprises address of sender, hopping distance that the sender is from the root node, source addresslist of system parameter, see col.3, line 65 to col.4, line 3 & col.6, lines 25-30 discloses that node 44 is 3 hops from root 20 and node 42 is 1 hop from root node 20); in response to receiving the hello message, the first network node transmitting a reply message containing network topology information about the first network node (after receiving the hello message from the attached node, the RF terminal 110 recognizes it is attached to nodes 44 and 42, see col.6, lines 25-27); and the second network node updating a range list of the second network node to include the network topology information about the first network node (attached nodes learns address of terminal by monitoring traffic from terminal passing by, and updating entries in routing table, see col.6, lines 45-63). Mahany et al. does not disclose the first network

node updating a range list of the first network node to include the network topology information about the second network node and a range list comprising routing information for only those nodes that are within one hop of the node.

Garcia-Luna-Aceves et al. discloses Garcia-Luna-Aceves et al. discloses creating a range list comprising routing information for only those nodes that are within one hop of the node; and obtaining network topology information of the node on the range list (each router 18 in network 10, fig.1, maintains a routing graph (range list) or topology graph (obtaining network topology information) that includes state information about adjacent links reported by its neighbors (network topology of the nodes on the range list. Col.6, lines 1-5, Further, the aggregation of adjacent links reported by neighbors constitutes partial topology known by a router, See col.6, lines 9-11). Garcia-Luna-Aceves et al. further discloses, in col.23, lines 25-35, that forming a partial topology graph for a router is made by combining router state information of each adjacent router (range list comprising routing information for only nodes that are within one hop).

Ogier et al. discloses in Fig.3 that node I enters, at step 100, a new link state information into topology table after receiving a message representing a link state update (see col.11, lines 27-45). Therefore, it would have been obvious to one ordinary skilled in the art to update the routing table in the RF terminal of the Mahany et al. by applying the teaching of Ogier et al. and the range list that comprises adjacent nodes of Garcia-Luna-Aceves et al. in order to update network topology information at each node in the network.

In claims 20, 21, 41 and 47, Mahany et al. discloses in response receiving the reply message from the first network node (upon receiving the attach request from the RF terminal, see

step 205, fig.2), the second network node transmitting a broadcast confirmation message (root node 20 transmits confirm message to establish end-to-end connection, see step 207, fig.2); and upon receiving broadcast confirmation message, the first network node updating a child list of the range list of the first network node (attached node updates CHILD LIST in its routing table, see col.13, lines 42-45).

In claim 25, 26 and 29, Mahany et al. does not disclose if the first network node determines from the confirmation message that the first network node has been picked as a parent node of the second network node, verifying that the second network node has selected a valid logical address of the second network node; if the second network node has not selected a valid logical address, the first network node choosing a new logical address of the second network node; and the first network node transmitting reply message to the second network node containing the new logical address of the second network node. Ogier et al. discloses, in fig.14, a receiving node A receiving a hello message comprising the IP address from node B (col.29, lines 52-60, step 288), node A verifies that the entry for neighbor node B does not exist in the table (verifying the logical address is invalid), an entry for node B is created in the table (choose a new logical address for second node, step 292). See col.30, lines 8-30. Therefore, it would have been obvious to one ordinary skilled in the art to modify the Mahany et al. to assign a new logical address in response an invalid address is detected as suggested by Ogier et al.. The assigning of new logical addresses to network node expand the wireless network as new node is joining and release the logical address as existing node is moving away the network.

In claims 27 and 28, the limitations of these claims have been addressed in claims 1-3 above.

In claims 32 and 33, as described in claim 1, Mahany et al. disclose the parent node (node 42) is selected to have a minimum depth to the root node(one hop away from root node 20) and minimum load value (RF terminal 114 is attached to the least busy node 50, see col.6, lines 20-45). Mahany et al. does not if a parent node of the first network node was deleted from the range list, selecting a new parent node of the first network node from the plurality of network nodes. Ogier et al. discloses if a parent node of the first network node was deleted from the range list, selecting a new parent node of the first network node from the plurality of network nodes (fig.3 disclose node I cancels an existing parent node and selects a new parent node, see col.12, lines 35-50). Therefore, it would have been obvious to one ordinary skilled in the art to modify the Mahany et al. to select new parent node as suggested by Ogier et al. in order to select a parent closest to the rrot node.

In claim 34, Mahany et al. discloses a detached packet sent by the RF terminal to change its location , but does not disclose activating a disconnect LED of the first network when the network node has not heard for the period of time. Activating a disconnect LED on the RF terminal such as a mobile telephone is inherent to any mobile user who lost connection from the network and wish to move to another location to initiate its hello message. Therefore, it would have been obvious to one ordinary skilled in the art to disconnect the mobile phone when the mobile phone lost connection to the network in order to save mobile phone battery while moving to another location.

In claims 35 and 36, Mahany et al. disclose a RF terminal, after being lost to its attached nodes, can reattach to its network by having its identification updated via new entry made in the table of the attached node(see col.7, lines 60-67 & col.6, lines 50-65). Mahany et

al. does not explicitly disclose that the child node is reassigned the logical address and a reply meesage is sent to the chield node informing the child node of the reassigned logical address. Making a new entry comprising address of terminal in the table corresponds to reassigning a logical address. Therefore, it would have been obvious to one ordinary skilled in the art reassign the logical address in Mahany to the child node and notify the child node of the new adress.

Allowable Subject Matter

Claims 51-53 are allowed.

The following is an examiner's statement of reasons for allowance:

In claim 51, the prior art does not disclose if a depth of the second network node is difterent from the stored value in the first network node's range list, the depth value of the second network node in the first network node's range list is updated; further comprising:

re-computing the minimum depth of the first network node, taken into account the new depth value of the second network node, to create a new minimum depth of the first network node;

if the new minimum depth is less than the original minimum depth, selecting the second network node as a parent of the first network node and updating network topology information of the first network node;

if the new minimum depth of the first node is greater than its original minimum depth, entering a recovery mode, wherein the recovery mode further comprises:

if an attempt to identify a third network node having a minimum depth to a root node of the network is successful, assigning the third network node as the parent of the first network node and updating network topology information of the second network node.

Claims 12, 23 and 14-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

In claims 12 and 23, the pror art does not disclose if the depth of the first network node from the root node is less than the minimum depth of the existing parent node of the second network node, further comprising:

determining if logical addressing is used in the network; if logical addressing is not used, further comprising:

assigning the first network node as a new parent node of the second network node;

the second network node transmitting a second confirmation message to the first network node; and

the second network node transmitting second update message to the plurality of network nodes containing information about the new parent node of the second network

node;

if logical addressing is used, further comprising: storing a logical address and an identifier of an old parent node of the second network node;

the second network node transmitting a second confirmation message to the first network node;

if the second network node receives a second reply message from the first network node in response to the second confirmation message, comprising:

the second network node updating logical address of the second network node;

the second network node transmitting third confirmation message the first network node; and

the second network node transmitting a second update message;

if the second network node does not receive the second reply message from the first network node in response to the second confirmation message within a first time-out period, the second network node restoring the old parent node as parent of the second network node;

if the depth of the first network node from the root node is not less than the minimum depth of the parent node of the second network node, the second network node transmitting the confirmation message.

In claim 14, the prior art does not disclose the first network node transmitting a first confirmation message to the second network node containing a new depth of the first network node from the root node with the second network node as the new parent node;

determining if logical addressing is used in the network;

if logical addressing is not used, further comprising: first network node transmitting a second update messages to the plurality of network nodes containing information about the new parent node of the first network node;

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Higgins et al. (pat. 6,370,146 B1) discloses Method and Apparatus ffor None Disruptive Addition of a new Node to an Internodal Network.

Ryu et al. (Pat. 6,791,949 B1) discloses Network Protocol for Wireless Ad-Hoc Networks.

Ahmed et al. (Pat. 6816460 B1) discloses Location Based Routing for Mobile Ad-Hoc Networks.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Nguyen whose telephone number is 571 272 3092. The examiner can normally be reached on Monday-Friday from 8AM to 5PM. The examiner can also be reached on alternate

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached on 571 272 3088. The fax phone number for the organization where this application or proceeding is assigned is 5712738300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hanh Nguyen

August 12, 2005

HANH NGUYEN
PRIMARY EXAMINER